






REMOVABLE FRAME FOR AN ELECTRONIC UNIT

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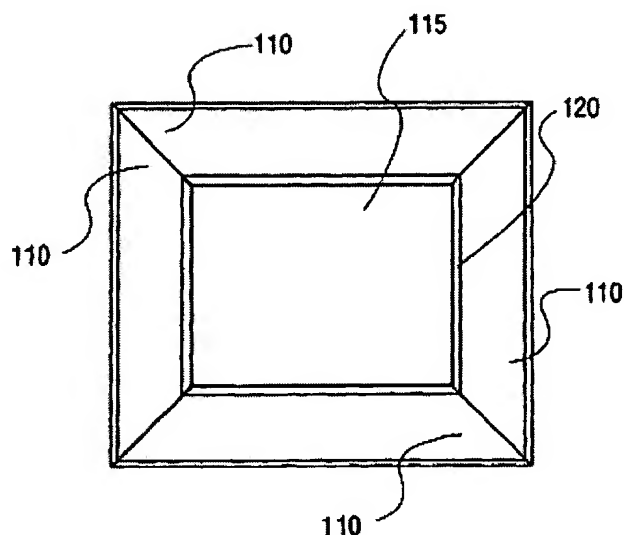
Cited documents:

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Abstract of WO0205610

A method and apparatus is disclosed for removably framing an electronic unit using a panel having a transparent aperture, the panel having an exterior surface with an ornamental covering applied thereon, the panel having an interior surface including a latch stop for removably engaging a latching recess on the electronic unit.



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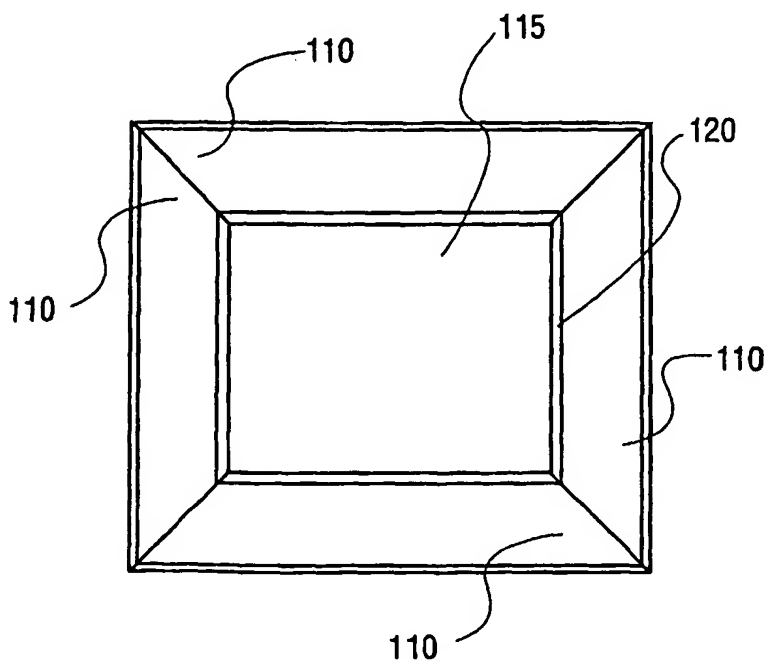
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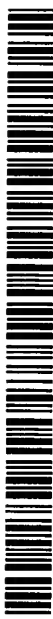
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(54) Title: REMOVABLE FRAME FOR AN ELECTRONIC UNIT



(57) Abstract: A method and apparatus is disclosed for removably framing an electronic unit using a panel having a transparent aperture, the panel having an exterior surface with an ornamental covering applied thereon, the panel having an interior surface including a latch stop for removably engaging a latching recess on the electronic unit.



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REMOVABLE FRAME FOR AN ELECTRONIC UNIT

FIELD OF THE INVENTION

The present invention relates generally to enclosures for electronic
5 devices.

BACKGROUND OF THE INVENTION

Conventional picture frames are well known for framing two-
dimensional images for viewing. Various implementations of slidable frame
backing are well known.

10 Other conventional frames include frame designs having an
attached enclosure or receptacle attached to the frame.

Other conventional technology includes interchangeable and
removable faceplates for electronic devices such as cellular telephones. For
example, U.S. Patent No. 5,768,370 describes a portable telephone with a plurality
15 of distinctive appearances implemented using an overlying cover removably
attachable to the telephone housing. Other design patents such as U.S. Patent No.
Des. 411,205 and Des. 421,442 describe a front cover for a telephone handset.

Each of these conventional frames or interchangeable faceplates is
incompatible for use on an electronic unit for enabling the appearance of the
20 electronic unit to be readily changed among a plurality of readily removable
frames.

SUMMARY OF THE INVENTION

A method and apparatus is disclosed for removably framing an
25 electronic unit using a panel having a transparent aperture, the panel having an
exterior surface with an ornamental covering applied thereon, the panel having an
interior surface including a latch stop for removably engaging a latching recess on
the electronic unit.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates a front view of the removable frame of the preferred embodiment;

Fig. 2 illustrates a side view of the removable frame of the preferred embodiment;

Fig. 3 illustrates a rear view of the removable frame of the preferred embodiment;

Figs. 4 and 5 illustrate cutaway views of the removable frame as removably attached to an electronics unit;

Fig. 6 illustrates a cross-sectional view of the panel of the preferred embodiment illustrating the latch stop and transparency notch;

Figs. 7 and 8 illustrate a cross-sectional view of the panel of the preferred embodiment as the panel is removably attached to an electronics unit; and

Figs. 9-14 illustrate an alternative embodiment of the present invention having a rounded exterior panel surface.

DETAILED DESCRIPTION OF THE INVENTION

A method and apparatus for removably framing an electronic unit is disclosed. In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be apparent to one of ordinary skill in the art that these specific details need not be used to practice the present invention. In other circumstances, well-known structures, materials, and processes have not been shown or described in detail in order not to unnecessarily obscure the present invention.

Referring to Fig. 1, a frontal view of the removable frame of the present invention is illustrated. The frontal view of the present invention shown in Fig. 1 illustrates the exterior surface of the panel 110, on which an ornamental covering may be applied. Such ornamental coverings may include transparent or colored paints or lacquers, wallpaper or bonded imagery, etching or carvings, or

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other type of conventional ornamental coverings. As shown in Fig. 1, panel 110 defines a transparent opening or aperture 115 through which a display device of an electronics unit may be viewed. Also shown in Fig. 1 is a beveled edge 120 providing better viewing of the display device of the electronics unit from various viewing angles. Panel 110 may be fabricated from a variety of conventional materials, e.g. plastic, wood, metal, fiberglass, composite material, or the like.

Fig. 2 illustrates the embodiment of Fig. 1 as viewed from an edge of panel 110. As indicated by the view shown in Fig. 2, this embodiment of the present invention represents one implementation of the present invention with a substantially flat exterior surface of panel 110.

Referring to Fig. 3, the interior surface of one embodiment of the present invention is illustrated. The inner or interior surface of this embodiment of the present invention includes a latch stop 300 fabricated into the interior surface of panel 110 and extending around the inner perimeter of panel 110. It will be apparent to those of ordinary skill in the art that latch stop 300 may extend around the entire perimeter of panel 110 or only a portion thereof. The latch stop 300 provides a means with which the panel 110 may be removably coupled to an electronics unit. This aspect of the present invention will be described in more detail in the figures that follow. Fig. 3 also shows a transparency recess provided in the interior surface of panel 110. The transparency recess 310 provides an interior surface for retaining a transparent plate between the panel 110 and an electronics unit to which the panel 110 is removably coupled. The transparent plate may be glass, plexiglass, polycarbonate, or other transparent material.

Figs. 4 and 5 illustrate an embodiment of the panel 400 as removably coupled to electronics unit 420. Transparent plate 410 is retained adjacent to electronics unit 420 as captured by the transparency recess 310 of panel 400. Figs. 4 and 5 also illustrate the latch stop 430 on the interior surface of panel 400. As will be described in more detail below, latch stop 430 enables the panel 400 to be removably coupled to electronics unit 420.

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Referring now to Fig. 6, a cutaway view of panel 400 is illustrated. Panel 400 in this embodiment includes various components as will be described in various dimensions. It will be apparent to one of ordinary skill in the art that these dimensions can be varied depending on the size and shape of the electronics unit being framed and the ornamental characteristics desired. In Fig. 6, panel 400 includes latch stop 600. In one embodiment of the invention, latch stop 600 includes a lead-in angle illustrated in Fig. 6 as Angle B 612. The lead-in angle of latch stop 600 facilitates the coupling of latch stop 600 with a latching recess in an electronics unit. Latch stop 600 further includes a retention angle defined by Angle A 610 shown in Fig. 6. The retention angle of latch stop 600 balances the secure coupling force needed to retain the panel 400 on the electronics device with the force needed to readily remove the panel 400 from the electronics unit. It will be apparent to one of ordinary skill in the art that the lead-in angle and the retention angles of latch stop 600 can be varied depending upon the characteristics of the material from which panel 400 is fabricated and the level of force desired for engaging or removing the panel 400 to and from the electronics unit 420.

Fig. 6 also illustrates the transparency notch 602 provided on the interior surface of panel 400. As shown, in this embodiment, transparency notch 602 is a substantially rectangular notch cut into the interior surface of panel 400 to retain a transparent plate therein. It will be apparent to one of ordinary skill in the art that the particular dimensions of transparency notch 602 may be varied depending on the dimensions of the transparent plate being used and the retention characteristics desired. Fig. 6 also illustrates the beveled edge 640 on the exterior surface of panel 400. The beveled edge 640 facilitates viewing of the display device of an electronics unit through the aperture 115 of panel 400.

Referring now to Figs. 7 and 8, a cross-sectional view of the panel 400 of one embodiment of the present invention is illustrated. Fig. 7 illustrates the panel 400 as removed from electronics unit 420. As described earlier, the panel 400 of this embodiment includes latch stop 600 and transparency notch 602. Further, electronics unit 420 includes a latching recess 710 in an outer surface of

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electronics unit 420. Latching recess 710 is conventionally fabricated of a dimension corresponding to a portion of the latch stop 600 of a frame panel 400. In one embodiment, electronics unit 420 includes a deflection channel 711 into which the latching recess 710 may be deflected by applying pressure at the point indicated by arrow 730. Panel 400 may be removably engaged to electronics unit 5 420 by elastically deflecting latching recess 710 into channel 711 of electronics unit 420 by applying force at the location indicated by arrow 730 shown in Fig. 7. As a result of this deflection of latching recess 710, panel 400 may be moved toward electronics unit 420, thereby moving the interior surface of panel 400 adjacent to an exterior surface of electronics unit 420. Upon relaxing the 10 deflection force on latching recess 710, the latch stop 600 of frame 400 moves into position inside of latching recess 710. The result of this action is illustrated in Fig. 8.

As shown in Fig. 8, the frame 400 has been removably engaged to 15 electronics unit 420 by engaging latch stop 600 of frame 400 into latching recess 710 of electronics unit 420. In this manner, frame 400 is securely but removably coupled to electronics unit 420. It will be apparent to one of ordinary skill in the art that equivalent latching structure may be used. For example, an alternative embodiment may exclude the deflection channel in electronics unit 420 but 20 instead fabricate panel 400 from a flexible material, which may be deflected to removably engage latch stop 600 into latching recess 710. In another embodiment, the latch stop traverses the internal perimeter of the frame at arbitrarily broken intervals or patterns, thus enabling the frame and the electronics unit to be uniquely configured to accept coupling with only properly configured 25 patterns of latch stops and cooperating latching recesses.

Also shown in Fig. 8, a transparent plate 410 is captured between frame 400 and electronics unit 420 in transparency recess 602 of frame 400. Transparent plate 410 spanning the aperture 115 of frame 400 provides a means for protecting electronics unit 420 from an exterior environment yet enabling the 30 viewing of a display device of electronics unit 420 through the aperture 115 and

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transparent plate 410. It will be apparent to one of ordinary skill in the art that transparent plate 410 may be substituted for any conventional transparent medium, such as plexiglass or transparent film. Further, it will be apparent to one of ordinary skill in the art that the frame 400 of the present invention may be used
5 without providing a transparent plate 410 within aperture 115. Again, the beveled edge 640 of frame 400 is illustrated in Fig. 8.

The exterior surface of the frame 400 embodiment illustrated in Fig. 8 is shown as a substantially flat surface except for beveled edge 640. It will be apparent to one of ordinary skill in the art that the exterior surface of frame 400
10 may be fabricated in a variety of ornamental shapes, configurations, colors, textures, or using other types of conventional fabrication techniques. One such alternative embodiment is illustrated in Figs. 9-14. Fig. 9 illustrates a frontal view of an alternative embodiment of the present invention. The exterior surface of the panel 910 illustrated in Fig. 9 is fabricated with a substantially rounded
15 dimension. This rounded exterior surface can be seen more clearly in the side view of this alternative embodiment illustrated in Fig. 10. Fig. 11 illustrates the interior surface of the alternative embodiment of the present invention. Again, this alternative embodiment includes latch stop 300 and transparency recess 310.

Referring to Figs. 12-14, the rounded exterior surface of the
20 alternative embodiment of the present invention is illustrated in more detail. Figs. 12 and 13 illustrate a cross-sectional view of one alternative embodiment of a removable frame 1200 of the present invention. As shown, the exterior surface of frame 1200 is rounded. However, this alternative embodiment of the present invention still includes the latch stop 600 and the transparency recess 602 as
25 shown in Fig. 14. This alternative embodiment is removably coupled to electronics unit 420 in the manner described above.

Thus, a removable frame for coupling to an electronics unit is disclosed. Although the present invention is described herein with reference to a specific preferred embodiment, many modifications and variations therein will
30 readily occur to those with ordinary skill in the art. Accordingly, all such

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variations and modifications are included within the intended scope of the present invention as defined by the following claims.

The invention has been described in detail with particular reference to certain preferred embodiments thereof, but it will be understood that variations
5 and modifications can be effected within the spirit and scope of the invention.

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WHAT IS CLAIMED IS:

1. A removable frame for an electronic unit comprising:
a panel having a transparent aperture, the panel having an exterior surface with an ornamental covering applied thereon, the panel having an interior surface including a latch stop for removably engaging a latching recess on the electronic unit.
2. A removable faceplate for an electronic unit comprising:
a panel having a transparent aperture, the panel having an exterior surface with an ornamental covering applied thereon, the panel having an interior surface including a latch stop for removably engaging a latching recess on the electronic unit.
3. The removable frame as claimed in claim 1 wherein the latch stop includes a lead-in angle to assist removable coupling with the latching recess.
4. The removable frame as claimed in claim 1 wherein the electronic unit includes a deflection channel allowing elastic deflection of the latching recess to assist removable coupling with the latch stop.
5. The removable frame as claimed in claim 1 wherein the panel further includes a transparency recess for retaining a transparent surface between the panel and the electronic unit.
6. The removable frame as claimed in claim 1 wherein the panel is substantially rectangular.
7. The removable frame as claimed in claim 1 wherein the exterior surface of the panel is substantially flat and includes at least one beveled edge.

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8. The removable frame as claimed in claim 1 wherein the exterior surface of the panel is substantially rounded and includes at least one beveled edge.

9. The removable faceplate as claimed in claim 2 wherein the latch stop includes a lead-in angle to assist removable coupling with the latching recess.

10. The removable faceplate as claimed in claim 2 wherein the electronic unit includes a deflection channel allowing elastic deflection of the latching recess to assist removable coupling with the latch stop.

11. The removable faceplate as claimed in claim 2 wherein the panel further includes a transparency recess for retaining a transparent surface between the panel and the electronic unit.

12. The removable faceplate as claimed in claim 2 wherein the panel is substantially rectangular.

13. The removable faceplate as claimed in claim 2 wherein the exterior surface of the panel is substantially flat and includes at least one beveled edge.

14. The removable faceplate as claimed in claim 2 wherein the exterior surface of the panel is substantially rounded and includes at least one beveled edge.

15. An electronic device with a removable faceplate comprising:
a panel having a transparent aperture, the panel having an exterior surface with an ornamental covering applied thereon, the panel having an interior

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surface including a latch stop; and

an electronic unit having a latching recess for removably engaging the latch stop of the panel.

16. The electronic device as claimed in claim 15 wherein the latch stop includes a lead-in angle to assist removable coupling with the latching recess.

17. The electronic device as claimed in claim 15 wherein the electronic unit includes a deflection channel allowing elastic deflection of the latching recess to assist removable coupling with the latch stop.

18. The electronic device as claimed in claim 15 wherein the panel further includes a transparency recess for retaining a transparent surface between the panel and the electronic unit.

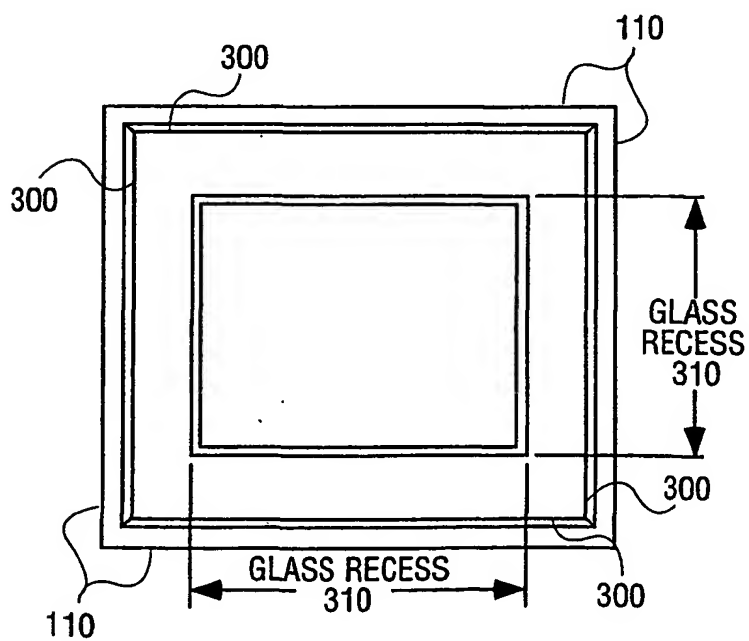
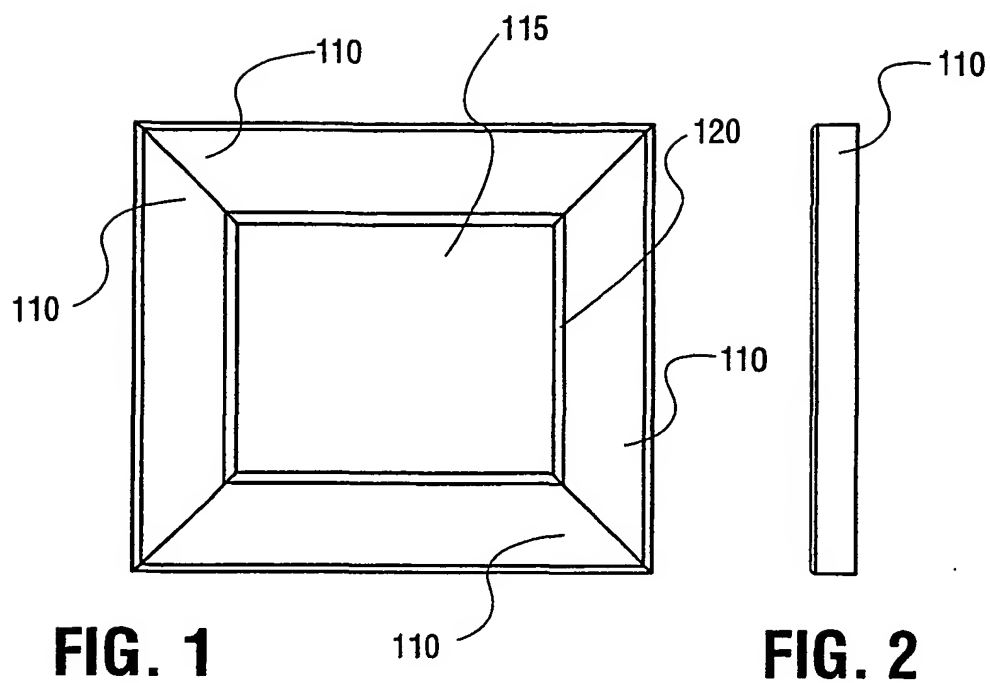
19. The electronic device as claimed in claim 15 wherein the panel is substantially rectangular.

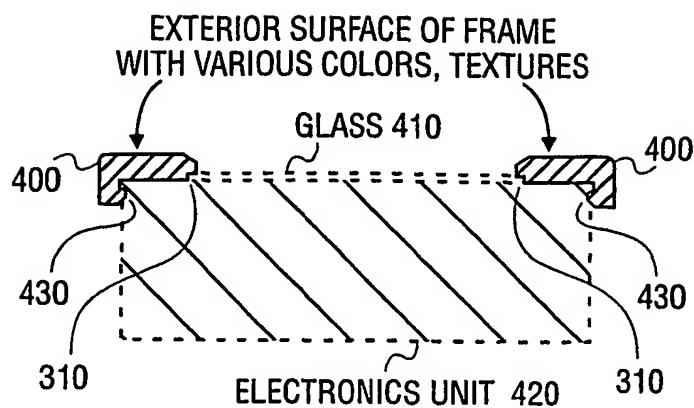
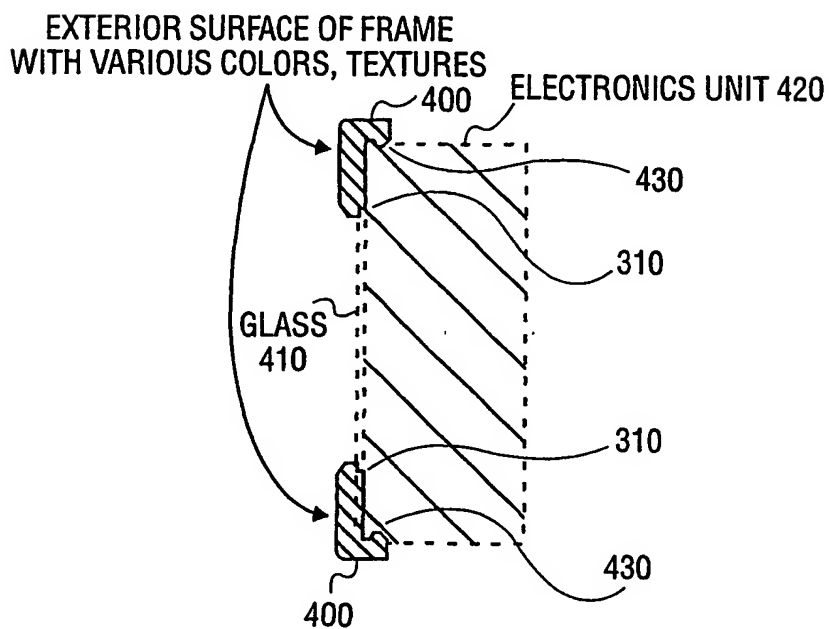
20. The electronic device as claimed in claim 15 wherein the exterior surface of the panel is substantially flat and includes at least one beveled edge.

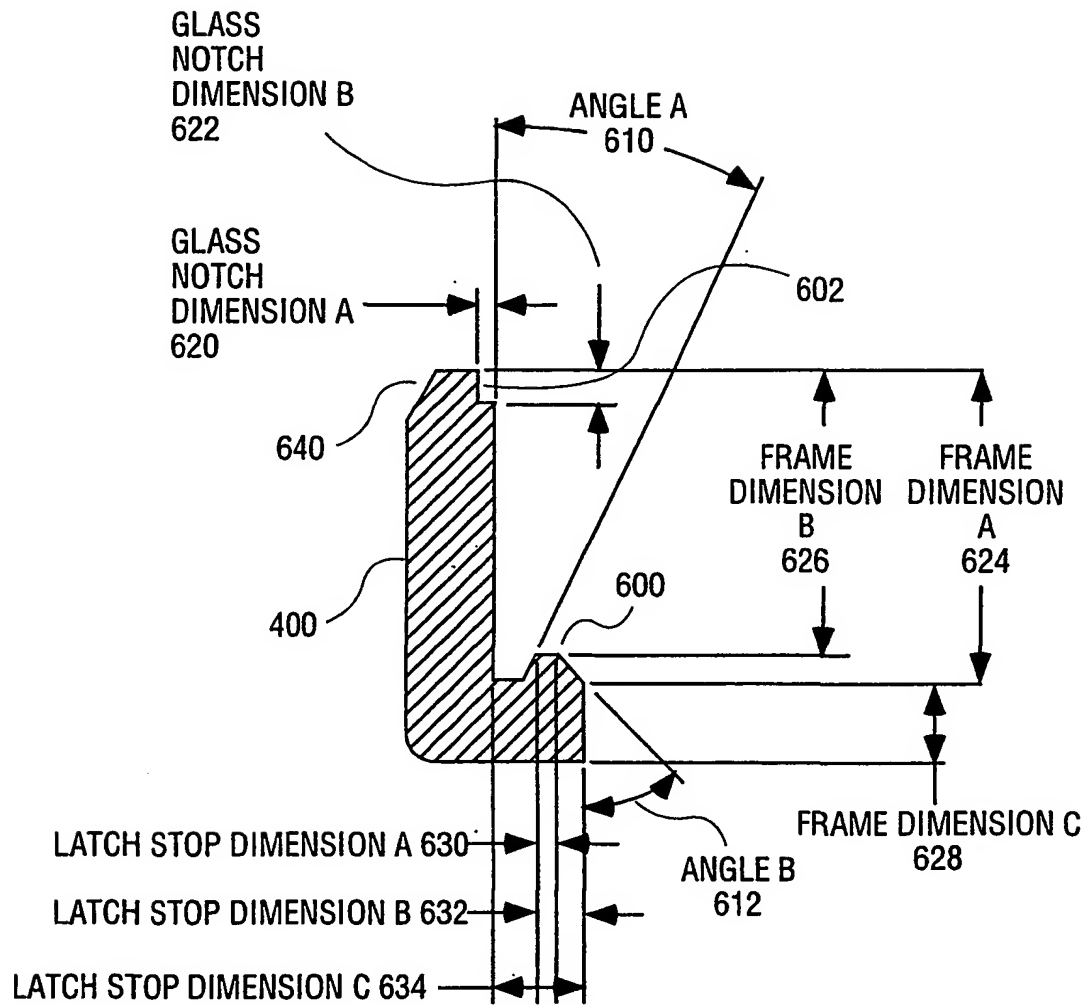
21. The electronic device as claimed in claim 15 wherein the exterior surface of the panel is substantially rounded and includes at least one beveled edge.

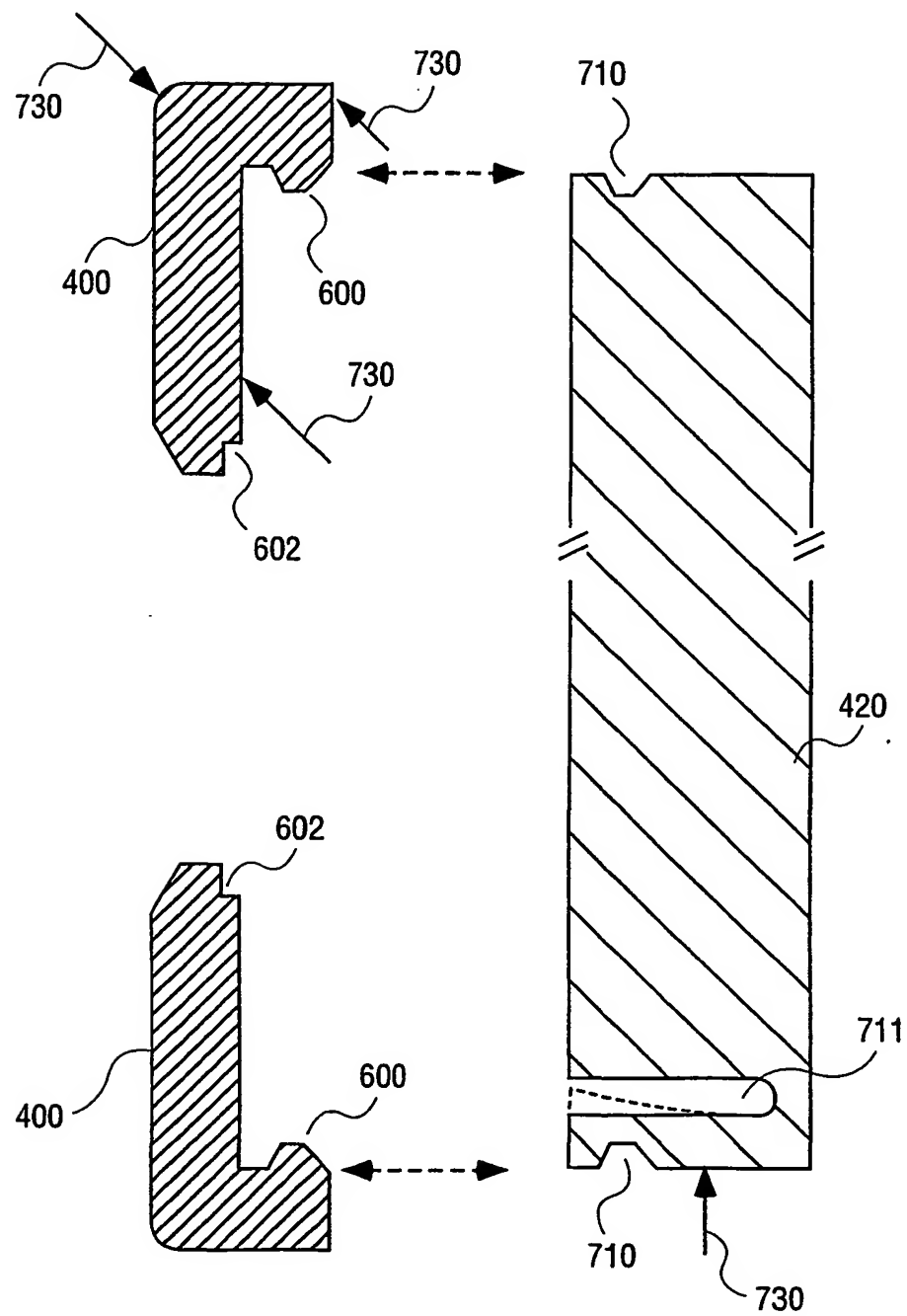
22. The removable frame as claimed in claim 1 wherein the latch stop traverses the internal perimeter of the frame in a particular pattern allowing the frame to be coupled only to a properly configured electronic unit with a similar pattern of latching recess.

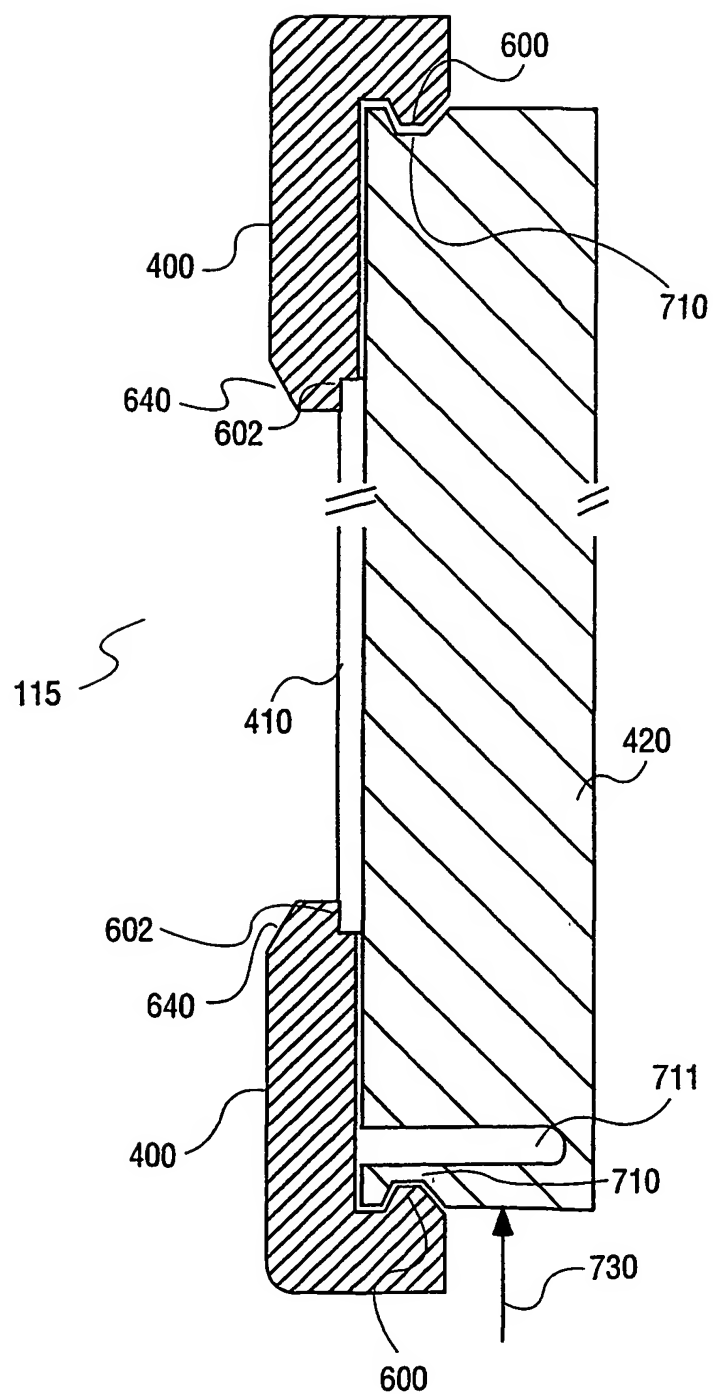
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**FIG. 4****FIG. 5**

**FIG. 6**

**FIG. 7**

**FIG. 8**

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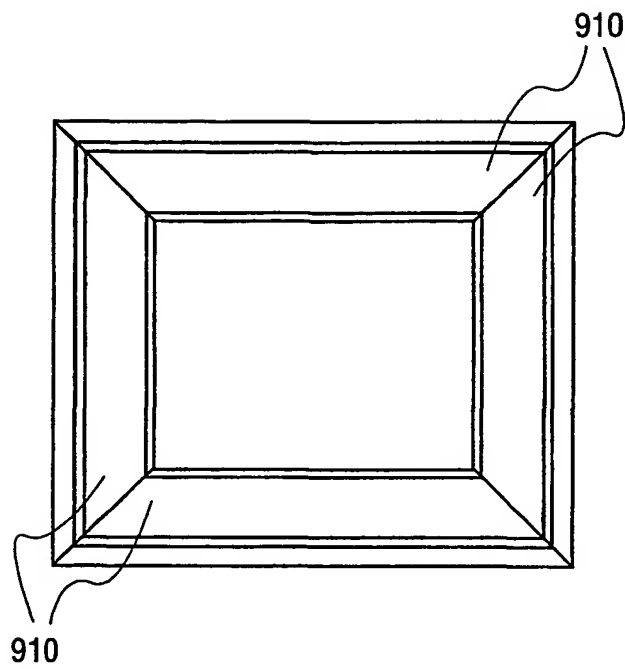


FIG. 9



FIG. 10

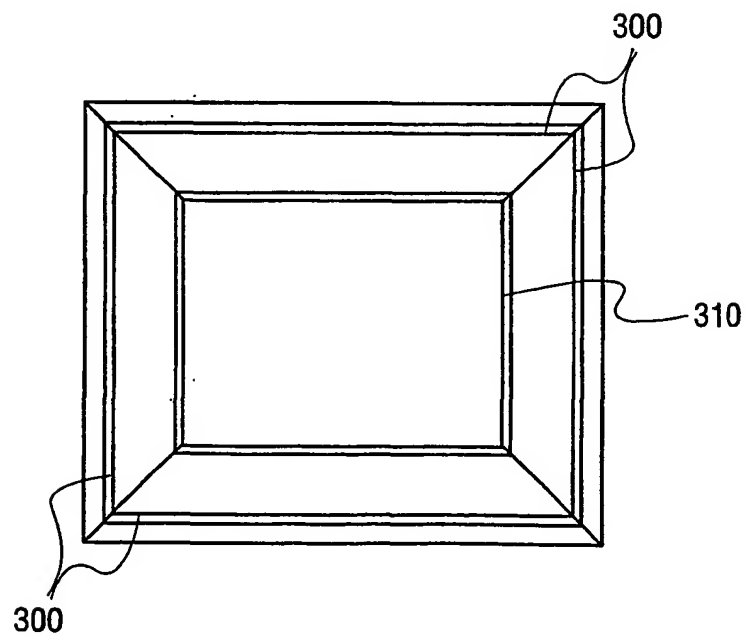


FIG. 11

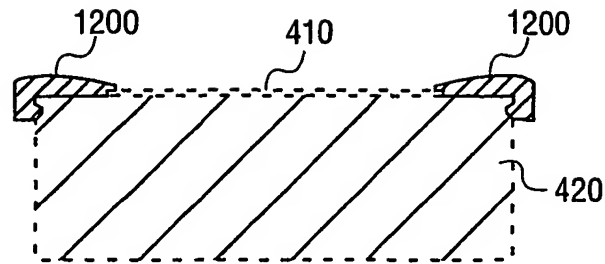


FIG. 12

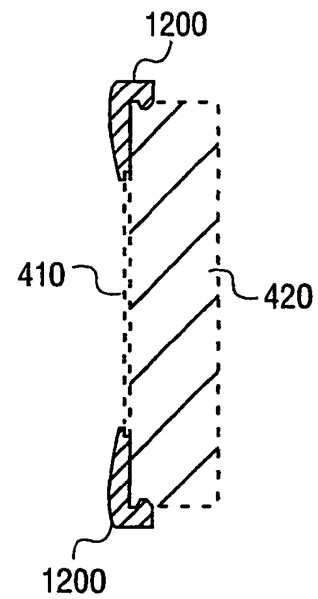


FIG. 13

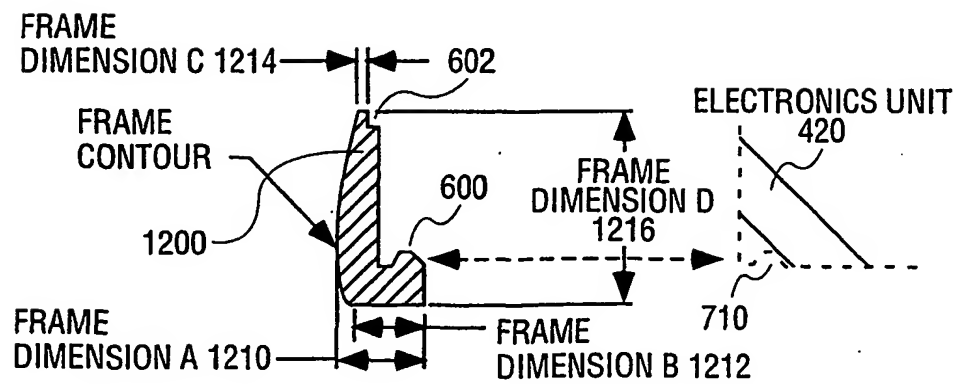


FIG. 14